

WHAT IS CLAIMED IS:

1. An imaging system comprising at least one pole piece comprising at least two grain-oriented sheets that are stacked together, wherein a direction of easy magnetization of a first of the at least two grain-oriented sheets is different than a direction of easy magnetization of a second of the at least two grain-oriented sheets.

2. An imaging system in accordance with Claim ~~1~~² further comprising a third grain-oriented sheet stacked together with the first and the second grain-oriented sheets, wherein the direction of easy magnetization of the second grain-oriented sheet forms an angle of approximately sixty degrees relative to the direction of easy magnetization of the first grain-oriented sheet, and a direction of easy magnetization of the third grain-oriented sheet forms an angle of approximately sixty degrees relative to the direction of easy magnetization of the second grain-oriented sheet.

3. An imaging system in accordance with Claim 2 wherein the second grain-oriented sheet is between the first and third grain-oriented sheets.

4. An imaging system in accordance with Claim 1 further comprising a third grain-oriented sheet stacked together with the first and the second grain-oriented sheets, wherein the direction of easy magnetization of the second grain-oriented sheet forms an angle of approximately forty-five degrees relative to the direction of easy magnetization of the first grain-oriented sheet, and a direction of easy magnetization of the third grain-oriented sheet forms an angle of approximately forty-five degrees relative to the direction of easy magnetization of the second grain-oriented sheet.

5. An imaging system in accordance with Claim 1 further comprising at least a pair of oppositely-facing magnets, each of the magnets having a center, the at least two sheets are stacked in a direction substantially parallel to a line extending substantially perpendicularly to the magnet centers.

6. An imaging system in accordance with Claim 1 further comprising at least a pair of oppositely-facing magnets, each of the magnets having a center, the at least two sheets are stacked in a direction substantially perpendicular to a line extending substantially perpendicularly to the magnet centers.

7. An imaging system in accordance with Claim 1 wherein each of the at least two sheets is fabricated from grain-oriented materials, wherein the grain-oriented materials include at least one of iron and aluminum, a combination of iron, aluminum and silicon, a combination of nickel and iron, and a combination of iron and silicon.

8. An imaging system in accordance with Claim 1 wherein the second grain-oriented sheet has a coercive force that is greater than a coercive force of the first grain-oriented sheet.

9. A magnetic resonance imaging (MRI) system comprising:

at least one pole piece including a plurality of members; and

at least two grain-oriented sheets included within each of the members, wherein a direction of easy magnetization of a first of the at least two grain-oriented sheets is different than a direction of easy magnetization of a second of the at least two grain-oriented sheets.

10. An MRI system in accordance with Claim 9 further comprising a third grain-oriented sheet stacked together with the first and the second grain-oriented sheets, wherein the direction of easy magnetization of the second grain-oriented sheet forms an angle of approximately sixty degrees relative to the direction of easy magnetization of the first grain-oriented sheet, and a direction of easy magnetization of the third grain-oriented sheet forms an angle of approximately sixty degrees relative to the direction of easy magnetization of the second grain-oriented sheet.

11. An MRI system in accordance with Claim 10 wherein the second grain-oriented sheet is between the first and third grain-oriented sheets.

12. An MRI system in accordance with Claim 9 further comprising a third grain-oriented sheet stacked together with the first and the second grain-oriented sheets, wherein the direction of easy magnetization of the second grain-oriented sheet forms an angle of approximately forty-five degrees relative to the direction of easy magnetization of the first grain-oriented sheet, and a direction of easy magnetization of the third grain-oriented sheet forms an angle of approximately forty-five degrees relative to the direction of easy magnetization of the second grain-oriented sheet.

13. An MRI system in accordance with Claim 9 further comprising at least a pair of oppositely-facing magnets, each of the magnets having a center, the at least two sheets are stacked in a direction substantially parallel to a line extending substantially perpendicularly to the magnet centers.

14. An MRI system in accordance with Claim 9 further comprising at least a pair of oppositely-facing magnets, each of the magnets having a center, the at least two sheets are stacked in a direction substantially perpendicular to a line extending substantially perpendicularly to the magnet centers.

15. An MRI system in accordance with Claim 9 wherein each of the at least two sheets is fabricated from grain-oriented materials, wherein the grain-oriented materials include at least one of iron and aluminum, a combination of iron, aluminum and silicon, a combination of nickel and iron, and a combination of iron and silicon.

16. An MRI system in accordance with Claim 9 wherein the second grain-oriented sheet has a coercive force that is greater than a coercive force of the first grain-oriented sheet.

17. A method for fabricating at least one pole piece for a magnetic resonance imaging (MRI) system, the method comprising:

fabricating at least two grain-oriented sheets, wherein a direction of easy magnetization of a first of the at least two grain-oriented sheets is different direction than a direction of easy magnetization of a second of the at least two grain-oriented sheets; and

coupling the at least two grain-oriented sheets together to form the pole piece for use in the MRI system.

18. A method in accordance with Claim 17 wherein a third grain-oriented sheet is stacked together with the first and the second grain-oriented sheets, the method further comprising:

developing an angle of approximately sixty degrees between the direction of easy magnetization of the second grain-oriented sheet and the direction of easy magnetization of the first grain-oriented sheet.; and

developing an angle of approximately sixty degrees between a direction of easy magnetization of the third grain-oriented sheet and the direction of easy magnetization of the second grain-oriented sheet.

19. A method in accordance with Claim 18 further comprising placing the second grain-oriented sheet between the first and third grain-oriented sheets.

20. A method in accordance with Claim 17 wherein a third grain-oriented sheet is stacked together with the first and the second grain-oriented sheets, the method further comprising:

developing an angle of approximately forty-five degrees between the direction of easy magnetization of the second grain-oriented sheet and the direction of easy magnetization of the first grain-oriented sheet.; and

developing an angle of approximately forty-five degrees between a direction of easy magnetization of the third grain-oriented sheet and the direction of easy magnetization of the second grain-oriented sheet.